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| 10/669,130 | 09/22/2003 | Isaac Shpantzer | 39878-0030 | 2886 |
| 25213 | 7590 | 09/11/2006 | EXAMINER | |
| HELLER EHRMAN LLP 275 MIDDLEFIELD ROAD MENLO PARK, CA 94025-3506 | | | CHU, CHRIS H | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2874 | |

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,130

Applicant(s)

SHPANTZER ET AL.

Examiner

Chris H. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 16-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 55-93 is/are allowed.
- 6) ☒ Claim(s) 1-12, 16-40, 42, 53 and 54 is/are rejected.
- 7) ☒ Claim(s) 41 and 43-52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed June 26, 2006 has been fully considered and entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 16-40, 42, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delavaux (5,060,312) in view of Schlaak (DE 3442988 A1).

Regarding claims 1, 17, 18, 20, 21 and 23, Delavaux discloses an optical device (phase diversity hybrid 160 in Fig. 2) with first and second inputs, comprising:

- a first coupler (162 in Fig. 2) connected to the first input and producing at least a first and second output;
- a second coupler (164 in Fig. 2) connected to the second input and producing at least a first and second output;
- a third coupler (170 in Fig. 2) connected to the first output of the first coupler and to the first output of the second coupler;

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- a fourth coupler (172 in Fig. 2) connected to the second output of the first coupler and to the second output of the second coupler;
- first and second crossing waveguides with an angle selected to minimize crosstalk and losses between the first and second cross waveguides, the first crossing waveguide connecting one of the first or second outputs from the first coupler with an input of the fourth coupler, the second crossing waveguide connecting one of the first or second outputs from the second coupler with an input of the third coupler in Fig. 2 and column 7, lines 67-68 to column 8, lines 1-2; and
- a first phase shifter (166 in Fig. 2) coupled to the first and second waveguides, the first and second waveguides connecting one of the outputs of the first or second coupler and one of the inputs of the third or fourth couplers and a second phase shifter (168 in Fig. 2), wherein the first, second, third and fourth couplers, the two crossing waveguides and the phase shifter are each formed as part of a single planar chip made of an electro-optical material in column 3, lines 8-13 and Fig. 2.

The examiner notes that the recitation concerning the receiving and demodulating of a quadrature modulated optical signal having one polarization in the preamble has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the

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structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Still regarding claims 1, 17, 18, 20, 21 and 23, Delavaux also teaches photodiodes (34, 36, 42, 44 in Fig. 1) for converting an optical signal into an electrical signal but do not show the photodiodes built on the same planar chip as the rest of the optical device. However, integrating components on the same chip is well known in the art and one having ordinary skill in the art at the time the invention was made would have found it obvious to do so in order to save space and produce a more robust optical device.

Still regarding claims 1, 17, 18, 20, 21 and 23, Delavaux teaches the claimed invention except for electrodes used to adjust the couplers. Schlaak teaches an independently adjustable coupler having biased electrodes in the abstract. Schlaak also teaches the electrodes to have alternating polarity and are split into an even integer number of sections to provide voltages having a reversed polarity in the abstract and Fig. 1. Schlaak also teaches the electrodes being used to control the output power ratio. Though Schlaak does not specifically state the electrodes configured to optimize a splitting operation point, it would have been obvious to one having ordinary skill in the art to do so, since optimizing the performance of any feature would always be beneficial. Since both inventions are coupler devices, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use electrodes with the coupler as disclosed by Schlaak in the optical device disclosed by Delavaux for the purpose of providing the capability to control the power splitting at the output.

Regarding claims 2-4, Delavaux teaches the claimed invention but does not specifically state the optical device used as a free-space optical link device, an optical pointing device or as a tracking device. However, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Regarding claims 5 and 36, Delavaux discloses an optical device further comprising a substrate in column 3, lines 8-13 and Fig. 2.

Regarding claims 6, 7 and 27-30, Delavaux teaches the claimed invention but does not specifically state the chip to be made of a semiconductor material selected from Si and InP or a ferroelectric material selected from LiNbO₃ and LiTaO₃ cut at X, Y or Z planes. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use those materials since it is well known to use semiconductor or ferroelectric materials for the purpose of creating chips.

Regarding claims 8 and 9, Delavaux discloses an optical device wherein the first and second couplers are Y-junctions in Fig. 2.

Regarding claim 10, Delavaux discloses an optical device further comprising a second phase shifter coupled to the first and second waveguides (168 in Fig. 2).

Regarding claim 11, Delavaux discloses an optical device wherein the first, second, third and fourth couplers are 3-dB devices in column 1, lines 58-60.

Regarding claims 12 and 16, Delavaux teaches the claimed invention except for the chip being a two-layer structure. Schlaak teaches a coupler on a chip having two

layers in Fig. 1. Schlaak also teaches the coupler to be on one layer, while the electrodes are formed in an adjacent second layer. Since both inventions are coupler devices, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a two layer chip as disclosed by Schlaak in the optical device disclosed by Delavaux for the purpose of providing the electrodes on a separate layer in order to allow the electrodes to be electrically connected to wires, for example. It would also have been obvious to one having ordinary skill in the art to place the phase shifters disclosed by Delavaux in this second layer since they are also electrically controlled.

Regarding claim 19, the proposed combination of Delavaux and Schlaak teaches the claimed invention but does not disclose the electrodes to be of a push-pull configuration. However, electrodes that are of a push-pull configuration are known in the art and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use them since they provide certain advantages such as increasing the linearity and range of modulation.

Regarding claims 22 and 24-26, Delavaux teaches the claimed invention but does not disclose the first and second phase shifters to be adjustable or include phase shifting electrodes. However, phase shifters that are adjustable using voltages to control the electrodes are known in the art and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use adjustable phase shifters with electrodes since providing the capability to be adjustable would always be beneficial.

Regarding claims 31-35, applicant is claiming the product including the process of making the optical device, and therefore are of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. In re Thrope, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. In re Brown and Saffer, 173 USPQ 685 and 688; In re Pilkington, 162 USPQ 147. As such no patentable weight is given to the process steps recited in claims 31-35.

Regarding claims 37 and 38, Delavaux teaches the claimed invention but does not specifically state the chip to include a substrate coated with a buffer wherein the buffer is silicon dioxide. However, it is well known that conventional chips have a substrate coated with a buffer layer of silicon dioxide and one having ordinary skill in the art at the time the invention was made would have found it obvious to use such a conventional chip.

Regarding claims 39, 40 and 42 Delavaux teaches a method of transmission, comprising an optical device with first, second, third and fourth couplers, two crossing

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waveguides and first and second phase shifters formed as part of a single planar chip made of an electro-optical material in Fig. 2. Delavaux does not teach applying a voltage to the couplers to maintain a desired power splitting ratio. Schlaak teaches applying a voltage to the couplers to maintain a desired power splitting ratio in the abstract. Since both inventions are coupler devices, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a voltage to the couplers as disclosed by Schlaak in the optical device disclosed by Delavaux for the purpose of providing the capability to control the power splitting at the output.

Still regarding claims 39, 40 and 42, Delavaux also teaches photodiodes (34, 36, 42, 44 in Fig. 1) for converting an optical signal into an electrical signal but the proposed combination of Delavaux and Schlaak do not show the photodiodes built on the same planar chip as the rest of the optical device. However, integrating components on the same chip is well known in the art and one having ordinary skill in the art at the time the invention was made would have found it obvious to do so in order to save space and produce a more robust optical device.

Regarding claims 53 and 54, the proposed combination of Delavaux and Schlaak teaches the claimed invention but does not specifically state the transmission applied to a ladar application or for spectral analysis. However, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Allowable Subject Matter

Claims 55-93 are allowed.

Claims 41 and 43-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 55-93, the claims are allowable in view of applicant's amendments and arguments to the claims.

Regarding claims 41 and 43-52, the claims are objected to in view of applicant's amendments and arguments to the claims.

Response to Arguments

Applicant's arguments with respect to claims 1-12, 16-40, 42, 53 and 54 have been considered but are not persuasive and are moot in view of the new ground(s) of rejection. The combination of Delavaux and Schlaak teaches a device with the same structure as claimed by the applicant. In response to the applicant's statement that Delavaux and Schlaak do not anticipate the claimed invention, the rejection made is of the obviousness type 103(a), and as such does not need to anticipate the claimed invention. The device taught by the combination of Delavaux and Schlaak meets the claimed limitations, and it is moot whether the combination would meet the communication systems requirements of present time. The advantages of the applicant's invention over the prior art are also moot if there are not any specific

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features claimed that differentiate the structure of the applicant's invention over that of the prior art references.

Applicant's arguments with respect to claims 41, 43-52 and 55-93 have been considered and are persuasive. As such, claims 55-93 are allowed and claims 41 and 43-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris H. Chu whose telephone number is 571-272-8655. The examiner can normally be reached on 8:30 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.



Chris H. Chu
Patent Examiner
August 30, 2006



MICHELLE CONNELLY-CUSHWA
PRIMARY EXAMINER

9/5/06